COMPUTER SCIENCE EDUCATION FOR ELEMENTARY TEACHERS

Introducing Michigan's new K-12 Computer Science Standards

Michigan's vision for computer science education is that all learners will develop foundational computer science skills to solve problems and be constructive citizens. In doing so, students will:

- Learn new approaches to problem-solving;
- Harness the power of computational thinking; and
- Use computer science tools to create technology.

Learn more about computer science and why the need is urgent.

Provide All Students with Access to Computer Science Learning

Computer science opportunities are not widely available for all students. Learners with the least access to computer science courses include minority, economically disadvantaged, and rural-area students. By adopting the new computer science standards, the Michigan Department of Education is committing to provide equitable access to these opportunities regardless of where students live in the state or the school they attend.

How This Looks in Elementary Schools

Learning computer science concepts begins as early as Pre-K and a device is not required ("unplugged" activities). Pre-readers can master the foundations of early coding concepts through learning patterns, problem-solving, representation, and sequencing. Computer science contributes to developing social and emotional skills in young students. Through play with their peers and adults, students learn how to effectively communicate and work in teams.

Integration is Key

There are many approaches to integrating computer science and computational thinking so it is not just one more thing to teach. Through integration, students have exposure to both traditional subjects and computational thinking. Some districts have embedded computational thinking into elementary literacy blocks to develop transdisciplinary modules that include science, ELA, and social studies within a problem-based theme. Initial findings of these transdisciplinary approaches integrating computer science show significantly increased literacy scores.[1] Finally, there are many professional development resources available so teachers with no prior computer science experience can teach and integrate computer science and computational thinking across subjects and into lesson plans.

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[1] Century, J., Ferris, K., and Zuo, H. "Finding Time for Computer Science in the Elementary Day: Preliminary Findings of an Exploratory Study," Outlier Research and Evaluation, Uchicago STEM Education at the University of Chicago, retrieved from https://s3.amazonaws.com/cemse/time-for-cs/docs/TimeforCS_Preliminary_Findings.pdf.

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